National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: DCA00MA006	Aircraft Registration Number: SUGAP
Occurrence Date: 10/31/1999	Most Critical Injury: Fatal
Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone	
ATLANTIC OCEAN	AO		0152	EST	

Airport Proximity: Off Airport/Airstrip	Distance From Landing Facility:	Direction From Airport:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
Boeing	767-366-ER	Airplane

Sightseeing Flight: No

Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

The Board's full report is available at http://www.ntsb.gov/publictn/publictn.htm.

On October 31, 1999, about 0152 eastern standard time (EST), EgyptAir flight 990, a Boeing 767-366ER (767), SU-GAP, crashed into the Atlantic Ocean about 60 miles south of Nantucket, Massachusetts. EgyptAir flight 990 was being operated under the provisions of Egyptian Civil Aviation Regulations (ECAR) Part 121 and U.S. 14 Code of Federal Regulations Part 129 as a scheduled, international flight from John F. Kennedy International Airport (JFK), New York, New York, to Cairo International Airport, Cairo, Egypt. The flight departed JFK about 0120, with 4 flight crewmembers, 10 flight attendants, and 203 passengers on board. All 217 people on board were killed, and the airplane was destroyed. Visual meteorological conditions prevailed for the flight, which operated on an instrument flight rules (IFR) flight plan.

On October 30, 1999, the accident airplane departed Los Angeles International Airport (LAX), Los Angeles, California, as EgyptAir flight 990, destined for Cairo, with a scheduled intermediate stop at JFK. EgyptAir flight 990 landed at JFK about 2348 eastern daylight time (EDT) and arrived at the gate about 0010 EDT on October 31, 1999.

Because of the 10-hour scheduled en route flight time from JFK to Cairo, ECAR Part 121, Subpart Q, required that the accident flight have two designated flight crews (each crew consisting of a captain and first officer). According to the EgyptAir flight dispatcher who accompanied the two accident flight crews from their hotel in New York City to the airport, they departed the hotel about 2330 EDT on October 30 and arrived at JFK about 40 minutes later, about the same time as the airplane, inbound from LAX, arrived at the terminal gate.

According to air traffic control (ATC) records, by 0101, the pilots of EgyptAir flight 990 had requested, received, and correctly read back an IFR clearance from ATC. ATC transcripts further indicated that between about 0112 and 0116, air traffic controllers issued a series of taxi instructions to EgyptAir flight 990. At 0117:56, the pilots advised the local controller that they were holding short of the departure runway (runway 22 right [22R]) and that they were ready for takeoff. The local controller instructed EgyptAir flight 990 to taxi into position and hold on runway 22R and, at 0119:22, cleared the accident flight for takeoff. The first officer acknowledged the takeoff clearance, and, about 0120, the airplane lifted off runway 22R.

Shortly after liftoff, the pilots of EgyptAir flight 990 contacted New York Terminal Radar Approach (and departure) Control (TRACON). New York TRACON issued a series of climb instructions and, at 0126:04, instructed the flight to climb to flight level (FL) 230 and contact New York Air Route Traffic Control Center (ARTCC). According to ATC and cockpit voice recorder (CVR) records, at 0135:52, New York ARTCC instructed EgyptAir flight 990 to climb to FL 330 and proceed directly to DOVEY intersection.

Narrative (Continued)

According to the CVR transcript, about 0140 (20 minutes after takeoff), as the airplane was climbing to its assigned altitude, the relief first officer suggested that he relieve the command first officer at the controls, stating, "I'm not going to sleep at all. I might come and sit for two hours, and then," indicating that he wanted to fly his portion of the trip at that time. The command first officer stated, "But II slept. I slept," and the relief first officer stated, "You mean you're not going to get up? You will get up, go and get some rest and come back." The command first officer then stated, "You should have told me, you should have told me this, Captain [relief first officer's surname]. You should have said, '[command first officer's first name]I will work first.' Just leave me a message. Now I am going to sit beside you. I mean, now, I'll sit by you on the seat. I am not sleepy. Take your time sleeping and when you wake up, whenever you wake up, come back, Captain."

The relief first officer then stated, "I'll come either waycome work the last few hours, and that's all." The command first officer responded, "Nothat's not the point, it's not like that, if you want to sit here, there's no problem." The relief first officer stated, "I'll come back to you, I mean, I will eat and come back, all right?" The command first officer responded, "Fine, look here, sir. Why don't you come so thatyou want them to bring your dinner here, and I'll go to sleep [in the cabin]?" The relief first officer stated, "That's good." The command first officer then stated to the command captain, "With your permission, Captain?"

At 0140:56, the CVR recorded the sound of the cockpit door operating. About 1 second later, the command first officer stated in a soft voice, "Do you see how he does whatever he pleases?" At 0141:09, the command first officer stated, "No, he does whatever he pleases. Some days he doesn't work at all." At 0141:51, the CVR again recorded the sound of the cockpit door operating. Sounds recorded during the next minute by the CVR (including a whirring sound similar to an electric seat motor operating, a clicking sound similar to a seat belt operating, and some conversation) indicated that the command first officer vacated and the relief first officer moved into the first officer's seat.

Flight data recorder (FDR) and radar data indicated that the airplane leveled at its assigned altitude of FL 330 at 0144:27. At 0147:19, New York ARTCC instructed EgyptAir flight 990 to change radio frequencies for better communication coverage. The command captain of EgyptAir flight 990 acknowledged and reported on the new frequency at 0147:39.

At 0147:55, the relief first officer stated, "Look, here's the new first officer's pen. Give it to him please. God spare you," and, at 0147:58, someone responded, "yeah." At 0148:03, the command captain stated, "Excuse me, [nickname for relief first officer], while I take a quick trip to the toiletbefore it gets crowded. While they are eating, and I'll be back to you." While the command captain was speaking, the relief first officer responded, "Go ahead please," and the CVR recorded the sound of an electric seat motor as the captain maneuvered to leave his seat and the cockpit. At 0148:18.55, the CVR recorded a sound similar to the cockpit door operating.

At 0148:30, about 11 seconds after the captain left the cockpit, the CVR recorded an unintelligible comment. Ten seconds later (about 0148:40), the relief first officer stated quietly, "I rely on God." There were no sounds or events recorded by the flight recorders that would indicate that an airplane anomaly or other unusual circumstance preceded the relief first officer's statement, "I rely on God."

At 0149:18, the CVR recorded the sound of an electric seat motor. FDR data indicated that, at 0149:45 (27 seconds later), the autopilot was disconnected. Aside from the very slight movement of both elevators (the left elevator moved from about a 0.7 to about a 0.5 degree nose-up deflection, and the right elevator moved from about a 0.35 degree nose?up to about a 0.3 degree nose-down deflection) and the airplane's corresponding slight nose-down pitch change, which were recorded within the first second after autopilot disconnect, and a very slow (0.5 degree per

National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB ID: DCA00MA006

Occurrence Date: 10/31/1999

Occurrence Type: Accident

Narrative (Continued)

second) left roll rate, the airplane remained essentially in level flight about FL 330 for about 8 seconds after the autopilot was disconnected. At 0149:48, the relief first officer again stated quietly, "I rely on God." At 0149:53, the throttle levers were moved from their cruise power setting to idle, and, at 0149:54, the FDR recorded an abrupt nose-down elevator movement and a very slight movement of the inboard ailerons. Subsequently, the airplane began to rapidly pitch nose down and descend.

Between 0149:57 and 0150:05, the relief first officer quietly repeated, "I rely on God," seven additional times. During this time, as a result of the nose-down elevator movement, the airplane's load factor decreased from about 1 to about 0.2 G. Between 0150:04 and 0150:05 (about 10 to 11 seconds after the initial nose-down movement of the elevators), the FDR recorded additional, slightly larger inboard aileron movements, and the elevators started moving further in the nose-down direction. Immediately after the FDR recorded the increased nose?down elevator movement, the CVR recorded the sounds of the captain asking loudly (beginning at 0150:06), "What's happening? What's happening?," as he returned to the cockpit.

The airplane's load factor decreased further as a result of the increased nose-down elevator deflection, reaching negative G loads (about -0.2 G) between 0150:06 and 0150:07. During this time (and while the captain was still speaking [at 0150:07]), the relief first officer stated for the tenth time, "I rely on God." Additionally, the CVR transcript indicated that beginning at 0150:07, the CVR recorded the "sound of numerous thumps and clinks," which continued for about 15 seconds.

According to the CVR and FDR data, at 0150:08, as the airplane exceeded its maximum operating airspeed (0.86 Mach), a master warning alarm began to sound. (The warning continued until the FDR and CVR stopped recording at 0150:36.64 and 0150:38.47, respectively.) Also at 0150:08, the relief first officer stated quietly for the eleventh and final time, "I rely on God," and the captain repeated his question, "What's happening?" At 0150:15, the captain again asked, "What's happening, [relief first officer's first name]? What's happening?" At this time, as the airplane was descending through about 27,300 feet mean sea level (msl), the FDR recorded both elevator surfaces beginning to move in the nose-up direction. Shortly thereafter, the airplane's rate of descent began to decrease. At 0150:21, about 6 seconds after the airplane's rate of descent began to decrease, the left and right elevator surfaces began to move in opposite directions; the left surface continued to move in the nose-up direction, and the right surface reversed its motion and moved in the nose?down direction.

The FDR data indicated that the engine start lever switches for both engines moved from the run to the cutoff position between 0150:21 and 0150:23. Between 0150:24 and 0150:27, the throttle levers moved from their idle position to full throttle, the speedbrake handle moved to its fully deployed position, and the left elevator surface moved from a 3 degrees nose-up to a 1 degree nose-up position, then back to a 3 degrees nose-up position. During this time, the CVR recorded the captain asking, "What is this? What is this? Did you shut the engine(s)?" Also, at 0150:26.55, the captain stated, "Get away in the engines," and, at 0150:28.85, the captain stated, "shut the engines." At 0150:29.66, the relief first officer stated, "It's shut."

Between 0150:31 and 0150:37, the captain repeatedly stated, "Pull with me." However, the FDR data indicated that the elevator surfaces remained in a split condition (with the left surface commanding nose up and the right surface commanding nose down) until the FDR and CVR stopped recording at 0150:36.64 and 0150:38.47, respectively. (The last transponder [secondary radar] return from the accident airplane was received at the radar site at Nantucket, Massachusetts, at 0150:34.)

Information about the remainder of the flight came from the airplane's two debris fields and recorded primary radar data from long-range radar sites at Riverhead, New York, and North Truro, Massachusetts, and the short-range radar site at Nantucket. The height estimates based on primary radar data from the joint use Federal Aviation Administration/U.S. Air Force radar sites indicated

National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: DCA00MA006

Occurrence Date: 10/31/1999

Occurrence Type: Accident

Narrative (Continued)

that the airplane's descent stopped about 0150:38 and that the airplane subsequently climbed to about 25,000 feet msl and changed heading from 80 to 140 degrees before it started a second descent, which continued until the airplane impacted the ocean.

Airplane wreckage was located in two debris fields, about 1,200 feet apart, centered at 40 degrees 21 minutes north latitude and 69 degrees 46 minutes west longitude. The accident occurred at night in dark lighting conditions.

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: DCA00MA006

Occurrence Date: 10/31/1999

Occurrence Type: Accident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
		Ft. MSL	0		

Runway Surface Type:

Runway Surface Condition:

Type Instrument Approach:

VFR Approach/Landing:

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
Boeing	767-366-ER	24542

Airworthiness Certificate(s): Transport

Landing Gear Type: Tricycle

Homebuilt Aircraft?	Number of Seats:	Certified Max Gross Wt.	Number of Engines:
No	217	LBS	2

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Turbo Fan	P&W	4060	

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Continuous Airworthiness	10/1999	214 Hours	33354 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?	ELT Operated?	ELT Aided in Locating Accident Site?
No	No	No

Owner/Operator Information

Registered Aircraft Owner	Street Address		
EGYPTAIR	City: Cairo	State	Zip Code

Operator of Aircraft	Street Address		
Same as Reg'd Aircraft Owner	City	State	Zip Code

Operator Does Business As:

Operator Designator Code: EGYF

- Type of U.S. Certificate(s) Held:

Air Carrier Operating Certificate(s): Foreign Operation

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 129: Foreign

Type of Flight Operation Conducted: Scheduled; International; Passenger/Cargo

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: DCA00MA006

Occurrence Date: 10/31/1999

Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
				57

Sex: M | Seat Occupied: Unknown | Principal Profession: Civilian Pilot | Certificate Number:

Certificate(s): Airline Transport

Airplane Rating(s):

Rotorcraft/Glider/LTA:

Instrument Rating(s):

Instructor Rating(s):

Type Rating/Endorsement for Accident/Incident Aircraft? Yes | Current Biennial Flight Review?

Medical Cert.: Unknown | Medical Cert. Status: Valid Medical--w/ waivers/lim. | Date of Last Medical Exam: 10/1999

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	14384	6356								
Pilot In Command(PIC)										
Instructor										
Last 90 Days										
Last 30 Days										
Last 24 Hours										

Seatbelt Used? | Shoulder Harness Used? | Toxicology Performed? No | Second Pilot? Yes

Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

Departure Point	State	Airport Identifier	Departure Time	Time Zone
NEW YORK	NY	JFK	0120	EST

Destination	State	Airport Identifier
CAIRO		HECA

Type of Clearance: IFR

Type of Airspace: Unknown

Weather Information

Source of Briefing: Company

Method of Briefing: In Person

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: DCA00MA006

Occurrence Date: 10/31/1999

Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
NAN	0153	EST	0 Ft. MSL	120 NM	0 Deg. Mag.

Sky/Lowest Cloud Condition: Clear Ft. AGL

Condition of Light: Night

Lowest Ceiling: None Ft. AGL

Visibility: 9 SM

Altimeter: 30.39 "Hg

Temperature: 13 °C

Dew Point: 11 °C

Wind Direction: 170

Density Altitude: Ft.

Wind Speed: 9

Gusts:

Weather Condtions at Accident Site: Visual Conditions

Visibility (RVR): 0 Ft.

Visibility (RVV) 0 SM

Intensity of Precipitation:

Restrictions to Visibility:

Type of Precipitation: None

Accident Information

Aircraft Damage: Destroyed

Aircraft Fire: None

Aircraft Explosion

Classification: Foreign Reg./Foreign Soil

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot	1				1
Second Pilot	1				1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants	10				10
Other Crew	2				2
Passengers	203				203
- TOTAL ABOARD -	217				217
Other Ground	0	0	0		0
- GRAND TOTAL -	217	0	0		217

National Transportation Safety Board **FACTUAL REPORT** **AVIATION**	NTSB ID: DCA00MA006 Occurrence Date: 10/31/1999 Occurrence Type: Accident	

Administrative Information

Investigator-In-Charge (IIC)

GREG PHILLIPS

Additional Persons Participating in This Accident/Incident Investigation:

TONY JAMES